Pedobiologia **30**, 179—206 (1987)
VEB Gustav Fischer Verlag Jena

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A review of the prey of predatory soil nematodes

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With one figure

(Accepted: 86-09-24)

1. Introduction

Previous reviews of nematode feeding habits have concentrated upon the allocation of species to one of a number of trophic groups (Overgaard-Nielsen 1949; Banage 1963; Yeates 1967d. 1971; Wood 1973a). The trophic categories recognised by these authors have varied but all have included predators as a distinct group. Yeates (in press) has indicated that the feeding group may change with developmental stage. In discussing predatory nematodes some information on the diet is usually given but there has been no comprehensive review of the prey of predatory nematodes; as a result such information is scattered throughout the literature, particularly as predatory nematodes are rarely the object of nematological research. This article attempts to summarise the known prey of predatory nematodes.

2. Sources of information

Possible predators are often identified by means of the buccal armature which can consist of a stomatostylet (tylenchid predators e.g. *Seinura* spp.), an odontostyle (dorylaimid predators e.g. *Labronema* spp.) or a wide buccal capsule usually armed with teeth and/or denticles (mononchid predators e.g. *Prionchulus* spp. and diplogasterid predators e.g. *Butlerius* spp.). In the absence of supporting evidence, however, such identifications must remain doubtful as the majority of stylet-bearing nematodes are not predatory and many diplogasterids are bacterial feeders. In addition no information on the prey of even confirmed predators can be obtained on this basis.

There are 6 ways in which the prey of predatory nematodes might be determined: direct observation, pot experiments, gut content analysis, faecal analysis, serological techniques and marking of potential prey. Of these only the first 3 techniques appear to have been used for predatory nematodes.

Direct observation includes records of prey attacked or eaten in samples of nematodes newly-extracted from soil and observations of nematodes in cultures. In both instances the possibility of abnormal behaviour cannot be excluded; in my experience many mononchids initially appear agitated when in "deep" water and fasten onto any "prey" (or even inanimate objects) without feeding; this is the probable explanation for the apparent ingestion of a filamentous alga by a *Prionchulus punctatus* Cobb, 1917 juvenile (Fig. 1). In cultures the choice of prey provided may not accurately reflect that available to a predator in soil. Nevertheless direct observation of predators in culture has yielded the majority of qualitative, and almost the only quantitative data on the prey of predatory nematodes (Steiner & Heinly 1922; Nelmes 1974; Mankau 1975; Grootaert, Jaques & Small 1977; Mohandas & Prabhoo 1980; Small & Grootaert 1983; Bilgrami *et al.* 1984a, b). Direct observation of predators in soil using root-observation laboratories is possible but no instances are known.

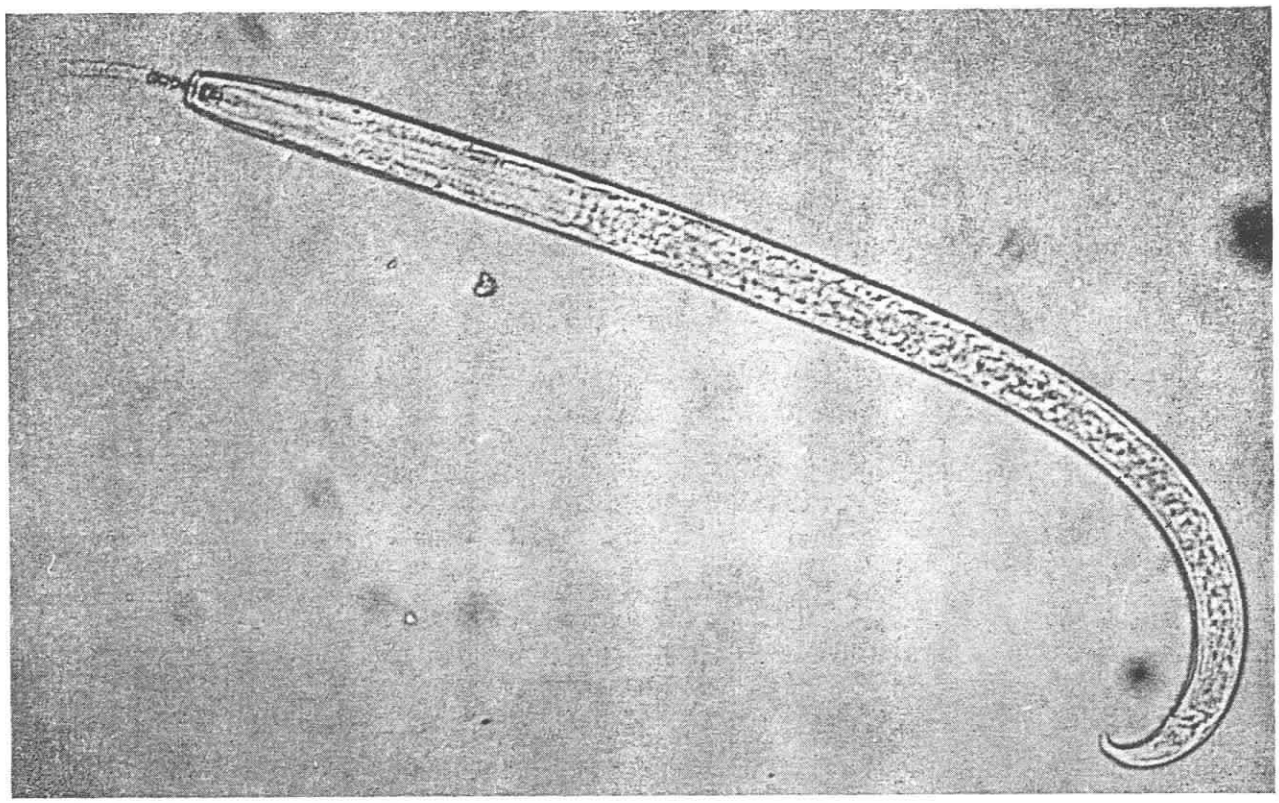

Fig. 1. Photomicrograph of second stage juvenile of *Prionchulus punctatus* apparently ingesting filamentous algae. Length of nematode 650 μm.

Pot experiments have been conducted that appear to show that some nematodes are susceptible to predation by mononchids (Cohn & Mordechai 1974; Small 1979), tylenchids (Cayrol 1970) or dorylaimids (Boosalis & Mankau 1965). In these studies the medium was not sterilised and in Small (1979) a range of prey nematodes were known to be present. This precludes any firm conclusions regarding the prey of the experimental predators but the circumstantial evidence of reduced "prey" numbers combined with direct observations in other trials has suggested some probable prey species.

The analysis of gut contents (which for predatory nematodes usually consists of observing the contents of the intestine through the body and intestine walls) has rarely been used in a systematic manner but numerous casual observations of this sort are recorded in the literature. Szczygiel (1971) conducted a study of the ecology of mononchids in Polish soils which included the examination of the gut contents of 13 species; 5 species were shown to have ingested nematodes. Gut content analysis has also been used by Thorne (1932), Goodey (1942) and Spaull (1973) for more than just casual records, but even when used systematically several disadvantages are associated with this method which relies on indigestible, or undigested, and identifiable remains (enchytraeid setae, nematode stylets, spicules, algal frustules etc.) in the gut. Predatory tylenchids and some dorylaimids are essentially fluid feeders and so no information can be gained for these groups and in mononchids and diplogasterids absence of recognisable remains also yields no information. In addition remains in the gut may only indicate what cannot be digested rather than items that contribute to the nutrition of the predator.

In an interesting (and previously unpublished) extension of gut content analysis, Grootaert (pers. comm.) recorded the gut contents of 31 specimens of *Anatonchus tridentatus* (De Man, 1876) De Coninck, 1939, and compared this with a random sample of 177 nematodes extracted from the same Belgian soil (Table 1). Adult *A. tridentatus* contained up to 12, and juveniles up to 6 whole prey and comparatively large nematodes (e.g. adult *Pungentus* and juvenile *Longidorus*) had been ingested. The study suggested that few, if any, of the available prey were rejected as only 5 species found in the community were not recorded amongst the gut contents. These were relatively uncommon species with only *Acrobeles*

Table 1. Gut contents of 31 *Anatonchus tridentatus* in comparison to the species structure of the nematode community in a Belgian soil (GROOTAERT, pers. comm.)

Species	Community				Gut Contents					
	Juveniles	Adults	Total	%	J_1	J_2	$J_3 + J_4$	Adults	Total	%
Pungentus sp.	2	1	3	1.7	3	3	2	1	9	8.0
Aporcelaimellus sp.	2	1	3	1.7	11	2	0	0	13	11.6
Eudorylaimus sp.	1	0	1	0.6	7	3	1	1	12	10.7
Longidorus sp.	—	—	29	16.4	5	5	0	0	10	8.9
Nygolaimus sp.	0	0	0	0	5	0	0	0	5	4.5
Alaimus sp.	8	3	11	6.2	11		1	0	12	10.7
Anaplectus granulosus	—	—	13	7.3	2	0	0	6	8	7.1
Plectus sp.	2	3	5	2.8	2	0	0	0	2	1.8
Monhystera sp.	6	3	9	5.1	4	0	1	0	5	4.5
Rhabditis sp.	4	3	7	4.0	6	0	0	0	6	5.4
Cephalobus sp.	22	13	35	19.8	8	0	8	2	18	16.1
Acrobeles sp.	2	2	4	2.3	0	0	0	0	0	0
Mylonchulus sp.	1	0	1	0.6	5	0	0	0	5	4.5
Clarkus papillatus	1	0	1	0.6	1	1	0	0	2	1.8
Anatonchus tridentatus	1	0	1	0.6	1	0	0	0	1	0.9
Aphelenchus avenae	5	6	11	6.2			1		1	0.9
Paratylenchus sp.	13		13	7.3			2		2	1.8
Aglenchus agricola	1	1	2	1.1			1		1	0.9
Aglenchus costatus	0	2	2	1.1						
Rotylenchus goodeyi	0	2	2	1.1			0		0	0
Basiria gracilis	0	1	1	0.6			0		0	0
Merlinius sp.	0	2	2	1.1			0		0	0
Trichodorus sp.	4	0	4	2.3			0		0	0
Unidentified	—	—	17	9.6			0		0	0
Totals			**177**	**100**					**112**	**100**

Note: J_1—J_4 = 1st to 4th juvenile stages.

sp. and *Trichodorus* sp. exceeding 2% of the fauna. On the other hand evidence that *A. tridentatus* may exercise some preference is suggested by the large proportion of some species, notably some dorylaimids, in the gut contents compared to that in the community.

Faecal analysis has not been used to determine the prey of predatory nematodes presumably because observation of gut contents is as easy and more informative. GOODEY (1929) did record a buccal capsule of *Diplogaster* sp. (= *Acrostichus* sp.?) in the faeces of *Fictor vorax* (GOODEY, 1929) PARAMANOV, 1952.

The 2 remaining methods have also not been used for nematodes. Serological techniques are likely to be of little use for such small organisms although they have been used for a mite (DEMPSTER 1960). The marking of potential prey with dyes or radioactive tracers which can be detected in predators that have fed upon these marked individuals is also likely to prove difficult in soil populations (there being no advantage in using this method in laboratory cultures in which predatory behaviour can be observed directly). These methods are the only ones that could be used to detect the prey of natural populations of the fluid-feeding predatory nematodes, with the possible exception of direct observation using root observation laboratories as previously suggested.

3. Comments on the summary

The information obtained from the literature has been summarised in 5 tables corresponding to the various taxa in which predatory nematodes are found (Tables 2—6).

Table 2. Summary of published information on the diet of predatory mononchids.

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Mononchids	Protozoa, rotifers, nematodes	—		Cobb 1917
	Nematodes, rotifers, oligochaetes	G, C		Menzel 1920
	Humus particles	G	Suggested as example of accidental ingestion	Overgaard-Nielsen 1949
	Nematodes, nematode eggs, *Discolaimus* sp.	O, C		Esser 1963
	Rhabditis sp.	—		Arpin 1969
Anatonchus spp.	Tylenchoidea, Rhabditoidea, Mononchidae, Aphelenchoidea, *Clarkus papillatus*	G		Szczygiel 1971
	Pratylenchus vulnus	—		Ritter & Laumond 1975
	Nematodes, oligochaetes, rotifers	—		Arpin 1980
Anatonchus amiciae Coomans & Lima, 1965	Dorylaim (juv.), enchytraeid	O	Fixed whilst feeding upon enchytraeid	Coomans & Lima 1965
	Mononchus sp. (juv.), tylenchs, dorylaims, oligochaete setae.	G		
	Xiphinema sp. odontostyle	O	Embedded in predators oesophageal tissue	
Anatonchus ginglymodontus Mulvey, 1961	Tylenchids, *Meloidogyne hapla*	O	As *Anatonchus tridentatus*	Szczygiel 1966
	Rhabditoidea, Tylenchoidea, Mononchidae, *Clarkus papillatus*	G		Szczygiel 1971
	Oxydirus sp., *Alaimus* sp.	—	Recorded by Cuany	Ritter & Laumond 1975
Anatonchus hortensis Andrassy, 1973	*Eudorylaimus* sp. (juv.)	O	Photomicrograph	Andrassy 1973
Anatonchus tridentatus (De Man, 1876) De Coninck, 1939	Nematodes, oligochaetes	—		Goodey 1942
	Panagrolaimus rigidus, *Cephalobus* spp., *Rhabditis* spp., *Paratylenchus macrophallus*, *Aglenchus agricola*, *Plectus parietinus*, Dorylaims (juv.), buccal spears, spicules and oesophageal valves of dorylaims, oligochaete setae, Leptomonad flagellates	G	Not clear if flagellates are ingested prey	
	Nematode	O	Photomicrograph	Mulvey 1961
	Dorylaimus sp.	O		Banage 1963
	Buccal spear of *Dorylaimus* sp. Setae of *Mesenchytraeoides* sp.	G		
	Rhabditoidea, Aphelenchoidea	G		Szczygiel 1971
	Oxydirus sp., *Alaimus* sp.	—	Recorded by Cuany	Ritter & Laumond 1975

	Nematode, possibly *Coomansus* sp.	G	Photomicrograph	Arpin 1980
		F	Attacked but failed to ingest *Globodera rostochiensis* juv.	Small & Grootaert 1983
	Pungentus sp., *Aporcelaimellus* sp. (juv.), *Eudorylaimus* sp., *Nygolaimus* sp. (juv.), *Longidorus* sp. (juv.), *Alaimus* sp. *Anaplectus granulosus*, *Plectus* sp., *Monhystera* sp. (juv.), *Rhabditis* sp. (juv.), *Cephalobus* sp. (juv.), *Aglenchus* sp. (juv.), *Aphelenchus* sp. (juv.), *Paratylenchus* sp. (juv.), *Pratylenchus* sp. (juv.), *Anatonchus* sp. (juv.), *Clarkus papillatus* (juv.), *Mylonchulus* sp. (juv.), enchytraeid setae.	G	Further details presented in text and Table 1. Note probable cannibalism.	Grootaert (pers. comm. 1985)
Clarkus gerlachei (De Man, 1904) Jairajpuri, 1970	Dorylaim odontostyle, *Plectus* sp., micro-organisms, algae, fungal hyphae and spores, collembolan remains, arthropod cuticular hairs, rotifer trophi, tardigrade claws.	G	Proportion of studied specimens containing various prey items recorded.	Spaull 1973
Clarkus mulveyi Sensu Mohandas & Prabhoo, 1980	Nematodes and nematode remains	G	Enchytraeid setae not found	Mohandas & Prabhoo 1980
	Tylenchorynchus nudus, *Helicotylenchus multicinctus*, *Rotylenchus reniformis*, *Meloidogyne incognita* (juv.), *Rhabditis* sp. *Monhystrella* sp., *Clarkus mulveyi* (juv.) *Iotonchus monhystera* (juv.), *Mylonchulus hawaiiensis* (juv.)	F	Potential prey species not fed upon: *Hirschmanniella oryzae*, *Hoplolaimus mangiferae*, *Scutellonema curvata*, *Criconemoides ornatum*, *Caloosia exilis*, *Xiphinema elongatum*, *Axonchium saccatum*, *Iotonchus kherai*, *Iotonchus nayari*, enchytraeids. Note cannibalism.	
Clarkus papillatus (Bastian, 1865) Jairajpuri, 1970	Nematodes, *Tylenchulus semipenetrans*	—		Cobb 1917
	Tylenchus sp., *Tylocephalus auriculatus* *Tripyla media*, *Turbatrix aceti*	O		Menzel 1920
	Subanguina radicicola, *Rhabditis* sp., *Turbatrix aceti*, *Rhabditis pellio*, *Caenorhabditis elegans*.	C	Some numerical estimates of predation on *S. radicicola*	Steiner & Heinly 1922
	Nematodes, *Heterodera schachtii*	—		Thorne 1927
	Other animals, *Coccomyxa* sp.	O		Overgaard-Nielsen 1948, 1949
	Nematodes	—		Williams 1958
	Nematodes	O	Photomicrograph	Mulvey 1961
	Clarkus papillatus	G	Note cannibalism	Lordello 1970
	Tylenchids, *Meloidogyne hapla*	—		Szczygiel 1966, 1971
	Rhabditidae, Cephalobidae	C		Arpin 1976
	Bacteria, fungi	G		Arpin & Kilbertus 1981

Table 2. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Clarkus venezolanus (Loof, 1964) Jairajpuri, 1970	? *Achromodora* sp., ? *Plectus* sp., *Rhabditis* sp., cephalobid, mononchid, spiral nematode, ? *Prismatolaimus* sp.	G	Most species listed within gut of one predator. Spiral nematode probably *Helicotylenchus* or *Scutellonema* and prey mononchid probably *Clarkus parvus*.	Loof 1964
Cobbonchusaustralis Clark, 1963	Cephalobids, plectids & others	G		Clark 1963
Cobbonchus inultus Carvalho, 1960	? Nematodes	—	Described as "possibly nativorous".	Lordello 1970
Cobbonchus palustris (Cobb, 1917) Andrassy, 1958	Rotifer "gizzard"	G	Preserved specimen	Cobb 1917
Iotonchus spp.	Nematodes, Protozoa Other mononchids	G —	As "*Mononchus* sp."	Carvalho 1953 Lordello 1970
Iotonchus acutus (Cobb, 1917) Andrassy, 1958	Nematodes, mononchid *Trichodorus obtusus*, *Rotylenchus robustus*, *Xiphinema americanum*, oligochaete setae and body fragments, rotifer.	— G		Cobb 1917 Thorne 1932
Iotonchus amphigonicus (Thorne, 1924) Andrassy, 1958	Nematodes and nematode remains. *Heterodera schachtii*	G		Thorne 1924
Iotonchus basidontus Clark, 1961	Rhabditids, tylenchids	— —	Recorded as predatory	Clark 1960 Yeates 1967d
Iotonchus brachylaimus (Cobb, 1917) Andrassy, 1958	Nematodes *Rhadopholus similis* (juv.), *Subanguina radicicola* (eggs + juv.), spear bearing nematode	G C	Photomicrograph	Cobb 1917 Cassidy 1931
	Tylenchulus semipenetrans	G	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Iotonchus gymnolaimus (Cobb, 1893) Andrassy, 1958.	Nematodes Nematodes	— —		Cobb 1917 Lordello 1970

Mohandas & Prabhoo, 1979	*Tylenchorhynchus nudus*, *Hirschmanniella oryzae*, *Scutellonema curvata*, *Helicotylenchus multicinctus*, *Rotylenchulus reniformis*, *Meloidogyne incognita* (juv.), *Xiphinema elongatum*, *Axonchium saccatum*, *Rhabditis* sp., *Monhystrella* sp., *Clarkus mulveyi*, *Iotonchus monhystera*, *Iotonchus kherai* (juv.), *Iotonchus nayari* (juv.), *Mylonchulus hawaiiensis*, enchytraeids.	F	Potential prey species not fed upon: *Hoplolaimus mangiferae*, *Criconemoides ornatum*, *Caloosia exilis*. Note cannibalism	Mohandas & Prabhoo 1980
Iotonchus maragnus Clark, 1961	Nematodes, *Iotonchus maragnus* (juv.)	—	Note cannibalism	Clark 1960
Iotonchus monhystera (Cobb, 1917) Jairajpuri, 1970	Nematodes	—		Cobb 1917
	Nematodes	G	No evidence of enchytraeids	Mohandas & Prabhoo 1980
	Tylenchorhynchus nudus, *Hirschmanniella oryzae*, *Helicotylenchus multicinctus*,	F	Potential prey species not fed upon: *Hoplolaimus mangiferae*, *Scutellonema curvata*, *Criconemoides ornatus*, *Caloosia exilis*, *Xiphinema elongatum*, *Axonchium saccatum*, *Clarkus mulveyi*, *Iotonchus kherai*, *Iotonchus nayari*, enchytraeids. Note cannibalism.	
	Rotylenchus reniformis, *Meloidogyne incognita* (juv.), *Rhabditis* sp. *Monhystrella* sp., *Iotonchus monhystera* (juv.), *Mylonchulus hawaiiensis* (juv.)	F		
	Helicotylenchus dihystera	G	Photomicrograph	Azmi 1983
Iotonchus nayari Mohandas & Prabhoo, 1979	Nematodes, enchytraeids	G		Mohandas & Prabhoo 1980
	Hirschmanniella oryzae, *Helicotylenchus multicinctus*, *Rotylenchus reniformis*, *Meloidogyne incognita* (juv.), *Xiphinema elongatum*, *Axonchium saccatum*, *Rhabditis* sp., *Monhystrella* sp., *Clarkus mulveyi*, *Iotonchus monhystera*, *Iotonchus kherai*, *Iotonchus nayari*, *Mylonchulus hawaiiensis*, enchytraeids.	F	Potential prey species not fed upon: *Tylenchorynchus nudus*, *Hoplolaimus mangiferae*, *Scutellonema curvata*, *Criconemoides ornatum*, *Caloosia exilis*. Note cannibalism.	
Iotonchus ophiocercus Clark, 1961	Nematode remains, dorylaimoid spears and spicules, stoma of *Iotonchus ophiocercus*.	G	Note cannibalism	Clark 1960
Iotonchus prabhooi Mohandas, 1979	Nematodes	G	No evidence of enchytraeids	Mohandas & Prabhoo 1980
	Rotylenchus reniformis, *Meloidogyne incognita*, *Axonchium saccatum*, *Rhabditis* sp., *Monhystrella* sp.	F	Potential prey species not fed upon: *Tylenchorynchus nudus*, *Hirschmanniella oryzae*, *Hoplolaimus mangiferae*, *Scutellonema curvata*, *Helicotylenchus multicinctus*, *Criconemoides ornatum*, *Caloosia exilis*, *Xiphinema elongatum*, *Clarkus mulveyi*, *Iotonchus monhystera*, *Iotonchus kherai*, *Iotonchus nayari*, *Mylonchulus hawaiiensis*, enchytraeids	

Table 2. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Iotonchus risoceiae (Carvalho, 1955) Andrassy, 1958	Nematodes, protozoans	—		Carvalho 1955
	Nematodes	—		Lordello 1970
Iotonchus trichurus (Cobb, 1917) Andrassy, 1958	Nematodes	—		Lordello 1970
Iotonchus vulvapapillatus Andrassy, 1964	*Tylenchorhynchus* sp., *Iotonchus vulvapapillatus*	G	Note cannibalism	Andrassy 1964
Miconchus digiturus (Cobb, 1893) Andrassy 1958	Nematodes	G		Mulvey 1962
	Nematodes, *Mylonchulus* sp.	G		Jairajpuri 1969
Miconchus fasciatus (Cobb, 1917) Andrassy, 1958	Nematodes	—		Cobb 1917
Miconchus kirikiri Yeates, 1967		—	Recorded as predatory	Yeates 1967 d
Miconchus rapax (Cobb, 1917) Andrassy, 1958	Nematodes	—		Cobb 1917
	Nematodes	—		Williams 1958
Miconchus reflexus Yeates, 1967	Oligochaete setae; dorylaimoid spears.	G		Yeates 1967 a
Mononchus spp.	*Meloidogyne marioni*	C	3 *Mononchus* spp.	Linford & Oliveira 1938
	Dorylaimus sp.	—		De Man 1884
	Pectidae, *Aphanolaimus attentus*, Chromadoridae (? *Monhystera* sp.), bacteria, plant fragments, fungal spores, nematode spicules.	G		Banage 1963
	Nematodes	C		Pillai & Taylor 1968 b
	Rhabditidae, *Aphelenchoides sp.*, *Heterodera* (eggs)	—		Arpin 1980
**Mononchus aquaticus* Coetzee, 1968	*Caenorhabditis briggsae*, *Panagrellus redivivus*, *Turbatrix aceti*, *Pelodera* sp. *Cephalobus* sp., diplogasterids, *Mononchus aquaticus*, 12 spp. Rhabditida	C	*Xiphinema* sp., *Aporcelaimellus* sp., both attacked but not eaten; tylenchid (probably *Rotylenchus* sp.)] not attacked. Note cannibalism.	Grootaert & Maertens 1976

	Meloidogyne naasi (juv.)			Grootaert, Jaques & Small 1977
	Panagrellus redivivus	C		Grootaert & Wyss 1979
	Panagrellus redivivus, *Rhabditis oxycerca* (juv.) *Plectus* sp. (juv.), *Monhystera* sp., *Meloidogyne naasi* (juv.), *Globodera rostochiensis* (juv.), *Rotylenchus falorobustus* (juv.)	F	Numerical estimates of attack, wounding and feeding rates. *Plectus* sp. attacked but not eaten.	Small & Grootaert 1983
	Cephalobus sp., *Mesorhabditis* sp. *Chiloplacens symmetricus*.	C	Includes observations on predatory behaviour. First and second stage juveniles appeared to ingest agar.	Bilgrami, Ahmad & Jairajpuri 1984b
Mononchus truncatus Bastian, 1865	Nematodes, rotifers, protozoa	—	As *Mononchus longicaudatus*	Cobb 1917
	Nematodes, rotifers	C	As *Mononchus macrosloma*	Thorne 1927
	Rhabditis spp., *Heterodera schachtii* (juv. + males)			
	Nematodes	—	As *Mononchus longicaudatus*	Williams 1958
	Tylenchoidea	G		Szczygiel 1971
Mononchus tunbridgensis Bastian, 1865	*Aphelenchus avenae*	C		Mankau 1980
	Tylenchulus semipenetrans	—	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Mulveyellus vorax (Cobb, 1917) Siddiqi, 1984	*Dorylaimus* sp., *Ironus* sp.	G		Cobb 1917
Mylonchulus agilis Doucet, 1980	*Helicotylenchus vulgaris* (juv.), *Rotylenchus fallorobustus* (juv.), *Longidorus caespiticola* (juv.)	O		Doucet 1980
Mylonchulus brachyuris (Bütschli, 1873) Altherr, 1954	*Subanguina radicicola* (juv.),	—		Cobb 1917
	? *Rhadopholus similis*, ? *Subanguina radicicola*	C		Cassidy 1931
		G	No ingested nematode remains	Goodey 1942
		—	Reported as nativorous	Williams 1958
	Bacteria	G		Arpin & Kilbertus 1981
Mylonchulus brevicaudatus (Cobb, 1917) Altherr, 1954	Nematodes, rotifers	—		Cobb 1917
Mylonchulus dentatus Jairajpuri, 1970	*Aphelenchus avenae*, *Helicotylenchus indicus*, *Hoplolaimus indicus* (juv.), *Tylenchorhynchus mashoodi*, *Acrobeloides* sp. (juv.), *Plectus* sp., *Meloidogyne* sp. (juv.)	F	Includes numerical estimates of predation.	Jairajpuri & Azmi 1978

Table 2. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Mylonchulus hawaiiensis (Cassidy, 1931) Andrassy, 1958	*Tylenchorhynchus nudus*, *Hirschmanniella oryzae*, *Rotylenchus reniformis*,	G	No evidence of nematodes or enchytraeids	Mohandas & Prabhoo 1980
	Meloidogyne incognita, *Rhabditis* sp., *Monhystrella* sp., *Clarkus mulveyi*, *Iotonchus monhystera*, *Mylonchulus hawaiiensis*	F	Potential prey species not fed upon: *Hoplolaimus mangiferae*, *Scutellonema curvata*, *Helicotylenchus multicinctus*, *Criconemoides ornatum*, *Caloosia exilis*, *Xiphinema elongatum*, *Axonchium saccatum*, *Iotonchus kherai*, *Iotonchus nayari*, enchytraeids. Note cannibalism.	
Mylonchulus parabrachyuris (Thorne, 1924) Andrassy, 1958	Rotifers, protozoa, *Rhabditis* sp. *Heterodera schachtii* (juv.)	C		Thorne 1927
Mylonchulus psammophilus Yeates, 1967		—	Recorded as predatory, possibly on enchytraeids	Yeates 1967 d
Mylonchulus rotundicaudatus (Skwarra, 1921) Andrassy, 1958		—	Described as predatory	Marinari *et al.* 1982
**Mylonchulus sigmaturus* (Cobb, 1917) Altherr, 1953	Micro-organisms, *Heterodera schachtii* (eggs), nematodes	C		Thorne 1927
	Rhadopholus similis, *Subanguina radicicola*	C	*Rhabditis* sp. not fed upon	Cassidy 1931
	Tylenchulus semipenetrans	—		Cohn & Mordechai 1973
	Tylenchulus semipenetrans, *Meloidogyne javanica*	C	Attacked unsuccessfully: *Helicotylenchus multicinctus* *Longidorus africanus*. Used in pot experiment with *Tylenchulus semipenetrans*.	Cohn & Mordechai 1974
	Tylenchulus semipenetrans	—	Verbal report in discussion at XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Mylonchulus striatus (Thorne, 1924) Andrassy, 1958		—	Recorded as predatory, possibly on enchytraeids.	Yeates 1967 d
Nullonchus levistomus Siddiqi, 1984	*Ironus* sp. *Mylonchulus* sp., dorylaim, *Acrobeles* sp., cephalobid, *Meloidogyne* sp., araeolaimid.	G		Siddiqi pers. comm. 1985

Siddiqi, 1984 Nullonchus reflex Nematody		G		Siddiqi 1984
Nullonchus valens Siddiqi, 1984	Nematodes	G		Siddiqi 1984
Parahadronchus shakili (Jairajpuri, 1969) Mulvey, 1978		—	Depicted feeding upon nematode.	Ahmad & Jairajpuri 1982
Prionchulus spp.	Rhabditidae, *Aphelenchoides* sp.	—		Arpin 1980
Prionchulus muscorum Dujardin, 1845)	Nematodes	—		Cobb 1917
Wu & Hoeppli, 1929	Tylenchs, *Plectus* sp.	—		Altherr 1950
	Nematodes	—		Williams 1958
	Detrital matter, bacteria, rotifer, nematode remains.	G		Banage 1963
	Plectus sp.	O		
	Tylenchoidea, Dorylaimoidea, Rhabditoidea, Aphelenchoidea	G		Szczygiel 1971
	Rhabditidae, Cephalobidae	C		Arpin 1976
	Panagrellus redivivus	C		Samsoen *et al.* 1984
**Prionchulus punctatus* Cobb, 1917	*Aphelenchus avenae*, *Panagrellus redivivus*, ciliates	C	*Anguina tritici*, *Helicotylenchus dihystera* attacked but not ruptured.	Nelmes 1974
	Caenorhabditis briggsae, *Panagrellus redivivus Turbatrix aceti*, *Eucephalobus striatus*, *Mesodiplogaster lheritieri*, *Prionchulus punctatus.*	C	Note cannibalism	Maertens 1975
	Meloidogyne naasi (juv.)	C		Grootaert, Jaques & Small 1977
	Panagrellus redivivus, *Aphelenchus avenae*	C	Used in pot experiment	Small & Evans 1981
	Panagrellus redivivus, *Rhabditis oxycerca* (juv.), *Monhystera* sp., *Meloidogyne naasi* (juv.), *Globodera rostochiensis* (juv.), *Rotylenchus fallorobustus* (juv.), *Bullerius degrissei*	F	Numerical estimates of attack, wounding and feeding rates included.	Small & Grootaert 1983
	Prionchulus punctatus	C	Cannibalism by females on males	Samsoen 1984
	Panagrellus redivivus	C		Samsoen *et al.* 1984
	Algae, protozoa, wounded enchytraeids, rotifers	C	See photomicrograph this paper	Small unpubl.
	Bacterial film		Also attacked tardigrades	
			Newly hatched *Prionchulus punctatus* juveniles	
Sporonchulus ibitiensis (Carvalho, 1951) Andrassy, 1958	Nematode remains, ? Dorylaimoidea sperm	G		Carvalho 1951
	Aphelenchus sp., *Aphelenchoides* sp., *Rhabditis* sp.	O		

Note: G: Gut content analysis; O: direct observation; C: observations on nematodes in culture; F: feeding experiment; —: no details given; * predators used in pot experiments; see text for further explanation.

Table 3. Summary of published information on the diet of predatory dorylaimids

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Dorylaimids	*Meloidogyne marioni*	C	14 spp. dorylaimids	Linford & Oliveira 1938
	Nematodes, nematode eggs, oligochaetes, rotifer (egg), mite, mononchs, *Belonolaimus longicaudatus*, *Criconemoides* sp.	C		Esser 1963
Actinolaimus spp.	Nematodes, *Meloidogyne marioni*	C		Linford & Oliveira 1937
		—	Recorded as predatory	Yeates 1971
Amphidelus eremitus Thorne, 1939		—	Reported as carnivorous and cannibalistic	Thorne 1939
Aporcelaimellus spp.	Nematodes, nematode eggs, *Aphelenchus avenae*, *Acrobeloides* sp., enchytraeids, rotifers, collembolan cadaver, algae, moss.	C	Reproduced on algae and moss but not on a diet of nematodes alone.	Wood 1973a
	Nematodes, nematode eggs, enchytraeids, rotifers, algae, moss.	C	Algae used in experiments: *Haematococcus* sp. and *Protosiphon* sp. good for culture; *Chlamydomonas* sp. *Chlorella vulgaris*, *Pleurococcus magna*, *Dactylococcus* sp., and *Hormidium mutens* less good; *Chlorococcum* sp., *Dictyococcus engadinensis* poor.	Wood 1973b
Aporcelaimellus amylovorus (Thorne & Swanger, 1936) Heyns, 1966	*Tylenchulus semipenetrans*	—	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Aporcelaimellus obscurus (Thorne & Swanger, 1936) Heynes, 1966	*Heterodera schachtii* (eggs)	O		Thorne & Swanger 1936
Aporcelaimellus obtusicaudatus (Bastian, 1865) Altherr, 1968	*Heterodera schachtii* (eggs)	O		Thorne 1928
		—	Described as essentially predatory	Marinari *et al.* 1982
Aporcelaimus spp.	Small oligochaetes	G		Thorne & Swanger 1936
	Heterodera trifolii	O		Doncaster 1962
	Small oligochaete setae	G		Goodey 1963
	Aphelenchus avenae, *Acrobeloides* sp. algae, moss	C	Three species of *Aporcelaimus* fed upon nematodes but failed to reproduce on diet of nematodes alone. Fed and reproduced on algae and moss.	Wood 1973a

Aporcelaimus regius (De Man, 1876) Thorne & Swanger, 1936	Oligochaete setae	G		Steiner 1924
	Enchytraeids	—		Thorne 1930
Aporcelaimus vorax Thorne & Swanger, 1936	Oligochaetes	G		Thorne & Swanger 1936
Aquatides thornei (Schneider, 1937) Ahmad & Jairajpuri, 1979	*Rhabditis* sp., *Chiloplacus symmetricus*	C		Bilgrami, Ahmad & Jairajpuri 1984
Axonchium sabuli (Yeates, 1967) Coomans & Yeates, 1969		—	Recorded as predatory	Yeates 1967 d
Carcharolaimus spp.	*Acrobeles* sp.	C		Esser 1963
Carcharolaimus dentatus Thorne, 1939	Small oligochaetes	—		Thorne 1939
Carcharolaimus pizae Lordello, 1953	Small oligochaetes	—		Goodey 1963
Discolaimium spp.	Nematodes	—		Goodey 1963
Discolaimus spp.	Nematodes, *Meloidogyne marioni*	C	2 spp. of *Discolaimus*	Linford & Oliveira 1937
			Recorded as predatory	Thorne 1939
	Aphelenchus sp., *Dorylaimus* sp., *Hemicycliophora* sp., bacteriophagous nematodes.	C		Esser 1963
	Tylenchulus semipenetrans	—	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Discolaimus arenicolus Yeates, 1967		—	Recorded as predatory	Yeates 1967 d
Discolaimus similis Thorne, 1939	*Dorylaimus* spear	G		Thorne 1939
Dorylaimus spp.	Mite eggs	O		Cobb 1929
	Meloidogyne marioni, nematode eggs	C	10 spp. *Dorylaimus* believed predatory.	Linford & Oliveira 1937
	Nematodes, nematode eggs, rotifers, ciliates, *Meloidogyne marioni*.	C	Oligochaete worms reported from earlier, unspecified publications.	Linford 1937
	Cephalobus sp.	—		De Man 1884
	Rhizopod (? *Nebela collaris*), algae	—		Overgaard-Nielsen 1949
		C	Recorded as predacious	Esser 1963
	Rod-shaped bacteria	G	Not clear if feeding upon these bacteria	Banage 1964
		—	Recorded as predatory	Yeates 1971
Dorylaimus asymphydorus Andrassy, 1969	Tubificids	—		Andrassy 1969

Table 3. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Durinema gracile (Thorne, 1939) Jairajpuri, 1968	*Rhabditis* sp. (juv.)	—		Thorne 1939
Eudorylaimus spp.	*Aphelenchus avenae*, *Acrobeloides* spp., algae, moss.	C	Did not reproduce on diet of nematodes alone; reproduced on diet of algae or moss.	Wood 1973a
	Nematodes	C		Sohlenius 1979
	Nematodes, fungi	—		Boosalis & Mankau 1965
Eudorylaimus carteri (Bastian, 1865) Andrassy, 1959	Mite eggs	—		Cobb 1929
Eudorylaimus ettersbergensis (De Man, 1885) Andrassy, 1959	Algae: *Chroococcus* sp. *Chlorella vulgaris*, *Tetraedron* sp.	—	*Chroococcus* sp. better for culture than other algal spp.	Hollis 1957
	Cysts of ciliate *Drepanomonas* sp., conidia of fungus *Cephalotheeium* sp., nematodes	C		
Labronema spp.		C	Recorded as predacious	Esser 1963
	Saprophagous nematodes	C		Ferris 1968
		—	Recorded as predatory	Yeates 1971
	Aphelenchus avenae, *Acrobeloides* sp., algae, moss	C	Reproduced on diet of algae or moss, but not on diet of nematodes only.	Wood 1973a
Labronema ferox Thorne, 1939	Oligochaetes	G		Thorne 1939
	Rhabditids, cephalobids, fungal spores	C		Ferris 1968
	Nematodes	C		Pillai & Taylor 1968b
Labronema pacificum (Cobb, 1906) Thorne, 1939	Nematodes	—		Thorne 1939
Labronema thornei Ferris, 1968	Rhabditids, cephalobids	C		Ferris 1968
**Labronema vulvapapillatum* (Meyl, 1954) Loof & Grootaert, 1984	*Panagrellus redivivus*, *Aphelenchus avenae*, *Anguina tritici*	C	*Pratylenchus penetrans* and *Xiphinema index* not fed upon	Wyss & Grootaert 1977

	Panagrellus redivivus, *Meloidogyne naasi*, *Globodera rostochiensis*	F	Numerical estimates of attack, wounding and feeding rates included. Unsuccessfully attacked *Rotylenchus fallorobustus*, *Rhabditis oxycerca* and *Butlerius degrisei*.	Small & Grootaert 1983
	Mononchus aquaticus (eggs), dead mite, harpacticoid copepod (nauplius larva)	C		Small unpubl.
Laimydorus marinus (Dujardin, 1845) Siddiqi, 1969	? Oligochaetes	G	Red material in gut believed to be derived from oligochaetes.	Thorne & Swanger 1936
Laimydorus serpentinus (Thorne & Swanger, 1936) Siddiqi, 1969	Nematodes	O		Thorne & Swanger 1936
Mesodorylaimus spp.	Coccoid algae, fungal spore, bdelloid rotifer, granules from ruptured collembolan	G		Spaull 1973
	Cryptopygus antarcticus, cadaver of *Clarkus gerlachei*	C		
	Tylenchulus semipenetrans	—	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	Mankau 1982
Neoactinolaimus dupliciden-tatus (Andrassy, 1968) Andrassy, 1970	*Panagrellus redivivus*	F	*Rhabditis oxycerca* and *Rotylenchus fallorobustus* unsuccessfully attacked.	Small & Grootaert 1983
Nygolaimium haguei Hunt, 1977	Oligochaete setae	G		Hunt 1977a
Nygolaimus spp.	Oligochaetes	G, O		Thorne 1930, 1939
	Small oligochaetes, oligochaete setae	G		Goodey 1963
		—	Recorded as predatory	Yeates 1971
	Aphelenchus avenae, *Acrobeloides* sp. rhabditids, cephalobids, *Nygolaimus* sp., nematode eggs, algal cell.	C	Note cannibalism	Wood 1973a
Nygolaimus aquaticus Thorne, 1930	Naididae setae	G		Thorne 1939
Nygolaimus brachyuroides Vinciguerra & Zullini, 1980		—	Recorded as predatory	Marinari *et al.* 1982
Nygolaimus directus Heyns, 1968	Enchytraeid setae	—	Population dynamics of *N. directus* and enchytraeids over 12 months recorded.	Yeates 1967d, 1968

Table 3. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Nygolaimus ferox THORNE, 1930	Oligochaete setae and cuticle	G		THORNE 1930, 1939
Nygolaimus vulgaris THORNE, 1930	Enchytraeids	G, O		THORNE 1930
Paractinolaimus vigor THORNE, 1967	*Cephalobus* sp.	C		HUNT 1977a
Pungentus monohystera THORNE & SWANGER, 1936	*Tylenchulus semipenetrans*	—	Verbal report in discussion XVIth Int. Symp. European Soc. Nematologists.	MANKAU 1982
Sectonema spp.	Oligochaetes	— —	 Recorded as predatory	THORNE 1930 YEATES 1971
Sectonema barbatoides HEYNS, 1966		—	Recorded as predatory	MARINARI *et al.* 1982
Sectonema rotundicauda GOODEY, 1951		—	Recorded as probably carnivorous	GOODEY 1963
Sectonema ventralis THORNE, 1930	Enchytraeids	G, O		THORNE 1930, 1939
Stomachoglossa bryophilum HUNT, 1978	Dead mesostigmatid mite	O		HUNT 1978
**Thornia* spp.	*Tylenchulus semipenetrans* (juv.), *Aphelenchus avenae*, Microbivorous nematodes, encysted amoebae, Fungi, Yeast cells	C	Used in pot experiment with *Tylenchulus semipenetrans*.	BOOSALIS & MANKAU 1965
Westindicus rapax HUNT, 1978	*Xiphinema* sp., dead enchytraeids, dead tardigrade.	O		HUNT 1978

Note: G, O, C, F, — and * as for Table 2; see text for further explanation.

Table 4. Summary of published information on the diet of predatory tylenchids

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Aphelenchoides spp.	*Meloidogyne marioni*	C	5 spp. *Aphelenchoides* = ? *Seinura*	Linford & Oliveira 1938
		—	Recorded as predatory	Yeates 1971
Aphelenchus spp.		—	Recorded as predatory	Yeates 1971
Aphelenchus avenae Bastian, 1865	*Eudorylaimus obtusicaudatus*	O	Photomicrograph	Decker 1962
	Cephalobus sp. (egg)	C		Boosalis & Mankau 1965
	Eudorylaimus obtusicaudatus, *Aphelenchus avenae* (egg)	—	Note cannibalism	Domurat 1970
Laimaphelenchus penardi (Steiner, 1914) Filipjev & Schuurmans Stekhoven, 1941	*Parasitorhabditis obtusa* (juv.)	—		McBeth 1937
Seinura spp.	Bacteriophagus nematodes, *Seinura* sp.	C	Not clear if cannibalism as more than one *Seinura* spp. present in culture.	Esser 1963
	Meloidogyne hapla, *Heterodera trifolii*, *Ditylenchus dipsaci*, *Neotylenchus linfordi*, *Aphelenchus avenae*.	C		Vinciguerra 1979
	Globodera rostochiensis	F		Small & Grootaert 1983
Seinura celeris	*Aphelenchus avenae*	C		Hechler & Taylor 1966
Seinura demani (Goodey, 1928) Goodey, 1960	*Acrobeloides* sp., *Chiloplacus* sp. *Plectus* spp. (2), *Wilsonema otophorum*, *Eucephalobus* sp. *Tylenchus* sp. *Aphelenchoides bicaudatus*, *Aphelenchus avenae*, *Tylencholaimus* sp. (juv.), *Seinura demani*, *Plectus* spp. eggs, *Aphelenchus avenae* eggs, *Seinura demani* eggs.	C	Note cannibalism	Wood 1974
Seinura oliveirae (Christie, 1939) Goodey, 1960	*Aphelenchus avenae*	C		Hechler & Taylor 1966
**Seinura oxura* (Paesler, 1957) Goodey, 1960	*Aphelenchus avenae*	C		Hechler & Taylor 1966
	Ditylenchus myceliophagus	—		Cayrol 1970

Table 4. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Seinura steineri Hechler & Taylor, 1965	*Aphelenchus avenae*	C		Hechler & Taylor 1966
Seinura tenuicaudata (De Man, 1895) Goodey, 1960	*Meloidogyne marioni*, *Pratylenchus pratensis*, *Aphelenchus avenae*, *Aphelenchoides parietinus*, nematode eggs	C		Linford & Oliveira 1937, Linford 1937
	Aphelenchus avenae, *Ditylenchus dipsaci*, *Heterodera trifolii* (juv.), *Meloidogyne hapla*, *Neotylenchus linfordi*, *Seinura* sp., *Seinura tenuicaudata*.	C	Unable to penetrate adult *Xiphinema* sp. or *Hoplolaimus galeatus*. Note cannibalism	Hechler 1963

Note: G, O, C, F, — and * as for Table 2; see text for further explanation.

Table 5. Summary of published information on the diet of predatory diplogasterids and rhabditids

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Butlerius spp.	*Rhabditis* sp.	C		Esser & Sobers 1963
	Aphelenchus avenae, ? *Naegleria gruberi*	C	Reared on bacteria/amoebae cultures but not clear which was prey.	Pillai & Taylor 1968a
	? bacteria		Recorded as predatory	Yeates 1971
Butlerius degrissei Grootaert & Jaques, 1979	*Panagrellus redivivus*, *Rotylenchus robustus*, *Aphelenchoides fragariae*, *Pratylenchus* sp., *Rhabditis oxycerca* (juv.), *Pelodera* sp. (juv.), *Cephalobus* sp., *Rhabdontolaimus stigmatus*, *Mesodiplogaster lheritieri*, *Plectus* sp. (juv.), *Alaimus* sp., *Mononchus aquaticus* (juv.), *Rhabditis* sp. (dauer-larvae), wounded enchytraeids	C	Also attacked: *Tylenchus macrurus*, *Meloidogyne naasi*, *Tripyla* sp., *Mesodorylaimus* sp. *Eudorylaimus* sp. Not attacked: *Merlinius* sp. *Tylenchorhynchus* sp., *Hemicycliophora* sp., *Trichodorus sparsus*.	Grootaert, Jaques & Small 1977
	Panagrellus redivivus	C		Grootaert & Jaques 1979
	Panagrellus redivivus, *Rhabditis oxycerca* (juv.), *Globodera rostochiensis* (juv.)	F	Also attacked: *Rhabditis oxycerca* (adult), *Meloidogyne naasi*, *Rotylenchus fallorobustus*, *Labronema vulvapapillatum* (juv.). Numerical estimates of attack, wounding and feeding rates included.	Small & Grootaert 1983

Butlerius gerlachi Meyl, 1957	Protozoa?	—		Meyl 1957
Butlerius macrospiculum Hunt, 1980	Nematodes	O		Hunt 1980
Butlerius micans Pillai & Taylor, 1968	*Aphelenchus avenae*, *Rhabditis* sp., *Panagrolaimus* spp., *Butlerius micans*	—	Note cannibalism	Pillai & Taylor 1968a
	? *Aerobacter aerogenes*, ? *Naegleria gruberi*	C	Reared on bacteria/amoebae cultures but not clear which was prey.	
Butlerius monhystera Taylor, 1964	Nematodes	O	Not established in culture on *Aphelenchus avenae*	Taylor 1964
Butlerius singularis Lordello & Zamith, 1959	Nematodes, *Butlerius singularis*	—	Note cannibalism	Lordello & Zamith 1959
Diplenteron spp.		—	Recorded as predatory	Yeates 1971
	Nematodes, microbes	C		Mankau 1980
Diplenteron colobocercus Andrassy, 1964	Nematode spicules	—		Yeates 1968
	Mesorhabditis littoralis, *Panagrolaimus australis*, *Acrobeloides syrtisus*, *Zeldia punua*, *Ereptonema inflatum*, *Takakia waipukea*, *Ethmolaimus* sp., *Eurystomina* sp., *Nygolaimus directus*, *Axonchium sabuli*, *Mylonchulus psammophilus*, *Diplenteron colobocercus*.	C	Note cannibalism — but observed on one occasion only. Enchytraeids not attacked. Appeared to ingest agar. Other aspects of predatory behaviour recorded.	Yeates 1969
Diplogaster spp.	*Meloidogyne marioni*	C	2 spp. of *Diplogaster*	Linford 1937, Linford & Oliveira 1938
Fictor anchicoprophaga (Paramanov, 1952) Goodey, 1963	Protozoa, *Aphelenchus avenae*, *Fictor anchicoprophaga*, ? *Naegleria gruberi*, ? bacteria.	C	Reared in bacteria/amoebae cultures but not clear which was prey. Note cannibalism.	Pillai & Taylor 1968b
Fictor vorax (Goodey, 1929) Paramanov, 1952	*Acrostichus microstoma*, nematodes, tardigrades, ciliates	O		Goodey 1929
Mesodiplogaster biformis (Hirschmann, 1951) Goodey, 1963	*Mesodiplogaster biformis*, bacteria	—	Note cannibalism	Hirschmann 1951
	Bacteria	—		Sohlenius 1968a
	Rhabditis terricola, *Pelodera teres*	—		Sohlenius 1968b
Mesodiplogaster lheritieri (Maupas, 1919) Goodey, 1963	? *Acrobeloides* sp.	—		Hirschmann 1951
	Acanthamoeba polyphaga	C		Anderson *et al.* 1978, Elliott *et al.* 1980

Table 5. (Continued)

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Mononchoides spp.	*Mononchus* sp., *Seinura* sp., *Panagrellus redivivus*	—	Attacked: oligochaetes, tardigrades, insect larvae.	Russell & Calaway 1967
	Insect eggs and larvae	—		Calaway 1968
	Aphelenchus avenae, ? *Naegleria gruberi* ? bacteria	C	Reared on bacteria/amoebae cultures but not clear which was prey.	Pillai & Taylor 1968b
	Nematodes, oligochaetes, insect eggs	—		Arpin 1980
Mononchoides bollingeri Goodrich, Hechler & Taylor, 1968	*Aphelenchus avenae*	C		Goodrich, Hechler & Taylor 1968
Mononchoides changi Goodrich, Hechler & Taylor, 1968	*Aphelenchus avenae*, ? *Naegleria gruberi*, ? *Aerobacter aerogenes*	C	Reared in bacteria/amoebae cultures but not clear which was prey.	Goodrich, Hechler & Taylor 1968
Mononchoides pulcher Zullini, 1981		—	Described as predatory	Zullini 1981
Mononchoides ruffoi Zullini, 1981		—	Described as predatory	Zullini 1981
Oigolaimella carinata Zullini, 1981		—	Described as predatory	Zullini 1981
Paroigolaimella bernensis (Steiner, 1914) Andrassy, 1958	? *Naegleria gruberi*, ? bacteria	C	Reared on bacteria/amoebae cultures but not clear which was prey.	Pillai & Taylor 1968b
Rhabditis terrestris Stephenson, 1942	Flagellates	C		Stephenson 1942

Note: G, O, C, F and — as for Table 2; see text for further explanation.

Table 6. Summary of published information on the diet of predatory enoplids, oncholaimids, tripylids and chromadorids

Predator	Prey or prey remains	Nature of observations	Comments	Reference
Ironus spp.		—	Supposed predatory	Menzel 1920
	Animals	—		Micoletzky 1921
	Bacteria	G	Not clear whether the bacteria were prey.	Banage 1964
Ironus ignavus Bastian, 1865		—	Supposed predatory	Cobb 1918

Ironus longicaudatus De Man, 1884	*Cephalobus* sp. (juv. and eggs)	C		Hunt 1977b
Eurystomina whangae Yeates, 1967	Oligochaete setae	G		Yeates 1967a
Tobrilus spp.	Animals	—	As *Tribolus* sp.	Micoletzky 1921
	Algae, diatoms, ciliates, rotifers	—		Goodey 1963
		—	Recorded as predatory	Yeates 1971
	Algae, diatoms, ciliates, rotifers	—		Arpin 1980
Tobrilus gracilis (Bastian, 1865) Andrassy, 1959	Rotifers	G, C		Menzel 1920
Tripyla spp.	Bacteria	G	Not clear whether bacteria are prey.	Banage 1963
	Algal cells	—	Recorded as predatory also	Yeates 1971
	Nematodes, rotifers	—		Arpin 1980
Tripyla affinis De Man, 1880	Nematodes	G		Goodey 1963
		—	Recorded as predatory	Marinari *et al.* 1982
Tripyla glomerans Bastian, 1865	Nematodes, rotifers, tardigrades	G, C		Menzel 1920
	Nematodes, rotifers, tardigrades, diatoms	—		Micoletzky 1921
	Nematodes, rotifers	—	As *Tripyla papillata*	Goodey 1963
Trischistoma spp.		—	Recorded as predatory	Vinciguerra 1979
Trischistoma arenicola (De Man, 1880) Schuurmans-Stekhoven, 1951	Rotifer mastax	G		Zullini 1978
Trischistoma macroseta Vinciguerra & La Fauci, 1978		—	Recorded as predatory	Marinari *et al.* 1982
Trischistoma monohystera (De Man, 1880) Schuurmans-Stekhoven, 1951	Nematodes, rotifers, protozoa	—		Cobb 1918
	Nematodes, rotifers	G		Goodey 1963
Trischistoma setifera (Bütschli, 1875) Altherr, 1965	Ciliates	O		Overgaard-Nielsen 1949
Synonchium pacificum Yeates, 1967	Oligochaete setae	G		Yeates 1967c

Note: G, O, C, F and — as for Table 2; see text for further explanation.

The summary includes only species known to feed upon other animals (but see below). The first entry in Tables 2 and 3 summarises information quoted by authors for the taxon as a whole. Thereafter the predators are grouped by genus with the first entry for each genus also being general (e.g. *Mononchus* spp.) to allow the inclusion of material for which the specific epithet of the predator was not given. It should be noted that the various authors within these general sections may not have been referring to the same species. Within genera entries are also arranged alphabetically using the specific name.

The prey or prey remains are recorded in the second column in as much detail as possible within the confines of the format. Where generic or specific names of prey are quoted by authors these are recorded in the summary. Where known predators have also been recorded as feeding upon non-animal prey this is included (e.g. the references to bacteria and detrital matter in the guts of *Mylonchulus brachyuris* (Bütschli, 1873) Altherr, 1954, and *Prionchulus punctatus* respectively). Records of feeding on dead animals are included (e.g. *Stomachoglossa bryophilum* Hunt, 1978). Species from genera known to include predators but which have only been recorded as feeding upon non-animal prey are excluded e.g. *Mylonchulus minor* (Cobb, 1893) Andrassy, 1958, on actinomycetes (Arpin & Kilbertus 1981), *Labronema rikia* Yeates, 1967, on algal cells (Yeates 1967b) and *Butlerius filicaudatus* Adam, 1930, on bacteria (Adam 1930).

Prey nematode names which are derived from pre-1971 publications have been revised where necessary in accordance with Tarjan & Hopper (1971); prey nematode names derived from post-1971 publications and names of all non-nematode prey are as given by the original authors. Names of predators have been revised where possible to correspond with currently accepted taxonomy. Prey marked? indicate that the original author was uncertain of the identification or of the precise nature of the prey.

The third column of the summary concerns the nature of the observations where this is known. Four techniques were recognised: gut content analysis (G), direct observation (O), observations on nematodes in culture (C) and feeding experiments (F). The division between direct observations and observations in culture is sometimes fine. In the summary observations in water are treated as direct observations unless it is clearly stated that the predators survived for considerable period, of time e.g. Steiner & Heinly's (1922) cultures of *Clarkus papillatus* (Bastian, 1865) Jairajpuri, 1970, in water. Where observations were made on predators in agar (or similar media) these were treated as in culture irrespective of the time span over which observations were made or whether the predators reproduced. Feeding experiments were considered to involve the deliberate introduction of a range of known prey (or potential prey) species to predators in water or in culture, with some attempt to quantify the outcome of predator-prey encounters.

The comments column of the summary allows brief explanations where necessary and other comments where desirable. Also included are the names of potential prey that the predator did not ingest for whatever reason. Such lists are usually derived from feeding experiments. The final column gives the source of information.

4. Analysis and discussion

The summary includes information on 152 predators that have been identified to at least genus: 55 mononchids, 49 dorylaimids, 11 tylenchids, 21 diplogasterids and 16 others. The majority (81 %) have been identified to species.

Analysis of the data is complicated by the frequent repetition of observations in the literature. It is therefore only possible to treat the information in a comparative manner. Table 7 shows the number of records of 6 prey types. Clearly nematodes are the most frequently recorded prey but whether this represents a genuine preference by the predators, or merely reflects the greater interest generated amongst nematologists considering natural control implications is impossible to ascertain. Amongst the larger predators oligochaetes (mainly enchytraeids) also feature prominently. Generally the dorylaimids are the most euryphagous and the tylenchids the most stenophagous. Some "predatory" dorylaimids also

Table 7. Analysis of the summary I

Predators	Prey Organisms						
	Nematodes	Oligochaetes	Rotifers	Tardigrades	Protozoa	Other	**Totals**
Mononchids	107 (74.8)	10 (7.0)	10 (7.0)	1 (0.7)	7 (4.9)	8 (5.6)	**143** (100)
Dorylaimids	43 (47.3)	22 (24.2)	4 (4.4)	1 (1.1)	4 (4.4)	17 (18.7)	**91** (100)
Tylenchids	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	**15** (100)
Diplogasterids	23 (59.0)	2 (5.1)	0 (0)	1 (2.6)	8 (20.5)	5 (12.8)	**39** (100)
Others	8 (25.0)	2 (6.3)	10 (31.3)	2 (6.3)	4 (12.5)	6 (18.8)	**32** (100)
Totals	**196** (61.3)	**36** (11.3)	**24** (7.5)	**5** (1.6)	**23** (7.2)	**36** (11.3)	**320** (100)

Note: Number of records (and %) referring to various prey organisms for each of 5 groups of predators (excluding records for predator taxa above genus).

Table 8. Analysis of the Summary II

Predators		Prey Trophic Categories					
		Phytoparasites	Microbivores	Fungivores	Predators	Omnivores (+ Unknown)	**Totals**
Mononchids	Records	82 (38.6)	71 (33.5)	9 (4.2)	42 (19.8)	8 (3.8)	**212** (100)
	Species	38 (41.3)	28 (30.4)	2 (2.2)	21 (22.8)	3 (3.3)	**92** (100)
Dorylaimids	Records	17 (38.6)	15 (34.1)	8 (18.2)	2 (4.5)	2 (4.5)	**44** (100)
	Species	9 (45.0)	6 (30.0)	1 (5.0)	2 (10.0)	2 (10.0)	**20** (100)
Tylenchids	Records	14 (35.0)	9 (22.5)	11 (27.5)	4 (10.0)	2 (5.0)	**40** (100)
	Species	10 (41.7)	8 (33.3)	2 (8.3)	3 (12.5)	1 (4.2)	**24** (100)
Diplogasterids	Records	4 (8.0)	29 (58.0)	6 (12.0)	11 (22.0)	0 (0)	**50** (100)
	Species	5 (12.8)	22 (56.4)	1 (2.6)	11 (28.2)	0 (0)	**39** (100)
Others	Records	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	**1** (100)
	Species	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	**1** (100)
Totals	Records	117 (33.7)	125 (36.0)	34 (9.8)	59 (17.0)	12 (3.5)	**347** (100)
	Species	**62** (35.2)	**65** (36.9)	**6** (3.4)	**37** (21.0)	**6** (3.4)	**176** (100)

Note: Number of records (and %) referring to the various trophic categories of prey nematodes, and number of prey species (and %) in each trophic category, for each of the 5 groups of predators (excluding records for predator taxa above genus). Prey species includes prey identified to generic level where this allows determination of trophic group.

appear to ingest algae or moss and the work of Wood (1973a) suggests such plant material to be essential for reproduction of some species. Such species are better considered omnivores at least until the relative nutritive value of ingested plant and animal matter is determined.

In Table 8 the distribution of records by prey nematode trophic group is shown. For all predators plant parasitic and microbivorous nematodes feature prominently, but again the former may result from the greater interest amongst authors and the latter from the common use of microbivorous nematodes as prey to maintain stock cultures in laboratory studies. Perhaps of greater value is the number of prey species within each trophic category which is also shown in Table 8. It is interesting that although the number of identified species may be much lower than the number of records (e.g. for mononchids there are 82 records of predation for just 38 identified phytoparasites) the proportions in each trophic category do not differ greatly in most instances. Where relatively large differences do occur it is possible to suggest the cause e.g. for tylenchids there are 11 records of fungivorous prey but only two named species. One of these species is *Aphelenchus avenae* Bastian, 1865 (treated as fungal feeding here despite the occasional record of predatory behaviour) which was used by Hechler (1963) and Hechler & Taylor (1966) as the prey in laboratory studies of the biology of several *Seinura* spp. Thus *A. avenae* features prominently in the literature (see summary).

Cannibalism has not been recorded in the predators of Table 6 and has a much lower incidence in dorylaimids than in the remaining groups of predators. Thus 22 % of mononchids, 27 % of tylenchids and 24 % of diplogasterids have been recorded as cannibalistic compared to just 4 % of dorylaimids. Why this should be is not clear.

Amongst the potential nematode prey that are not successfully attacked two groups exist, if the physical problem experienced by a small predator attacking a much larger prey is excluded. In one group the resistant species respond to contact by rapid movement and so elude most attacks. This appears to be most common amongst microbivorous nematodes e.g. *Pelodera* sp. and *Plectus* sp. (Small & Grootaert 1983).

The second group possess thick cuticles, with or without heavy ornamentation, or retain cuticles from previous moults. In both cases predatory nematodes are unable to penetrate the cuticle and Small & Grootaert (1983) suggest such features may have evolved as anti-predation devices. Their prevalence amongst otherwise vulnerable ectoparasitic nematodes has been remarked upon by other authors (e.g. Esser 1963, Mankau 1975 and Mohandas & Prabhoo 1980). However these features are not restricted to ectoparasites; Goodey (1929) suggests that the cuticular ridges of *Fictor vorax* preclude cannibalism and Small & Grootaert (1983) record the difficulty experienced by predators attacking adult *Rhabditis oxycerca* De Man, 1895.

Such defences are particularly effective against dorylaimids and tylenchids when penetration of the cuticle is essential for feeding. Mononchids and diplogasterids are able to swallow prey whole, although the small size of diplogasterids usually precludes such feats on all but the juveniles of small prey species. The ability amongst mononchids also varies with size. The wide prey range for *A. tridentatus* recorded by Grootaert and reported in this paper may result from its relatively large size enabling it to swallow many prey whole. The same may apply to several of the *Iotonchus* species investigated by Mohandas & Prabhoo (1980). The size and range of species of prey that can be successfully attacked probably contributes to niche separation amongst predatory nematodes in soils where several species are present.

In conclusion it may be said that our knowledge of the natural prey of predatory nematodes is slight. Much of the information that is available stems from chance observations and there is a need for more quantitative data on diet width and predation rates. Knowledge of which apparently available prey are in fact unavailable to predatory nematodes is also important if we are to understand their biology, their contribution to natural control of plant parasitic nematodes and hence their potential as biological control agents.

5. Acknowledgements

I acknowledge the additional information furnished by Dr. M. Siddiqi on *Nullonchus levistomus* Siddiqi, 1984. I express my sincere thanks to Dr. P. Grootaert for allowing me to use his unpublished data and for drawing my attention to some sources of published information.

6. References

Adam, W., 1930. Ein neuer freilebender Nematode aus der Erde: *Butlerius filicaudatus* n. spec. Zool. Anz. **91**, 139—142.

Altherr, E., 1950. Les nématodes du Parc National suisse. (Nématodes libres du sol). Ergebn. wiss. Unters. Schweiz Nat. Parks n. s. **3**, 1—46.

Anderson, R. V., E. T. Elliott, T. T. McClellen, D. C. Coleman, C. V. Cole & H. W. Hunt, 1978. Trophic interactions in soils as they affect energy and nutrient dynamics, III. Biotic interactions of bacteria, amoebae and nematodes. Microb. Ecol. **4**, 361—371.

Andrassy, I., 1964. Süßwassernematoden aus den Großen Gebirgsgegenden Ostafrikas. Acta-Zool. Acad. Scient. Hung. **10**, 1—59.

— 1969. Taxonomische Übersicht der Familien Prodorylaimidae n. fam. und Dorylaimidae de Man, 1876. Opusc. Zool. (Budapest) **9**, 187—233.

1973. 100 neue Nematodenarten in der ungarischen Fauna. Opusc. Zool. (Budapest) **11**, 7—48.

Arpin, P., 1969. Étude préliminaire d'un facteur écologique important pour les Nématodes: l'humidité actuelle du sol. Rev. Écol. Biol. Sol. **6**, 429—435.

— 1976. Étude et discussion sur un milieu de culture pour Mononchidae (Nematoda). Rev. Écol. Biol. Sol. **13**, 629—634.
— 1980. Les éléments prédateurs de la microfaune du sol. In: P. Pesson, (ed.), Actualités d'Écologie Forestiére. Paris. Gauthier-Villars, 507—517.
— & G. Kilbertus, 1981. Ultrastructure du contenu digestif et de l'épithèlium intestinal chez quelques nématodes prédateurs (Mononchida) et bactériophages. Revue Nématol. **4**, 131—144.
Azmi, M. I., 1983. Predatory behaviour of nematodes 1. Biological control of *Helicotylenchus dihystera* through the predaceous nematode *Iotonchus monhystera*. Indian J. Nematol. **13**, 1—8.
Banage, W. B., 1963. The ecological importance of free-living soil nematodes with special reference to those of moorland soil. J. Anim. Ecol. **32**, 133—140.
— 1964. Some aspects of the ecology of soil nematodes. Proc. E. Afr. Acad. **2**, 67—74.
Bilgrami, A. L., I. Ahmad & M. S. Jairajpuri, 1984a. Predatory behaviour of *Aquatides thornei* (Nygolaimina: Nematoda). Nematologica **20**, 457—462.
— — — 1984b. Observations on the predatory behaviour of *Mononchus aquaticus*. Nematol. medit. **12**, 41—45.
Boosalis, M. G., & R. Mankau, 1965. Parasitism and predation of soil microorganisms. In: K. F. Baker & W. C. Snyder (eds.), Ecology of soil-borne plant pathogens. Berkeley, Univ. of California Press, 374—391.
Calaway, W. T., 1968. *Mononchoides* associated with waste water treatment. J. Nematol. **1**, 5—6 (Abstr.).
Carvalho, J. C., 1951. Una nova espècie de *Mononchus* (*M. ibitiensis* n. sp.) Bragantia **11**, 51—54.
— 1953. *Mononchus* — um predador voraz. Rev. Inst. Adolfo Lutz. **13**, 75—81.
— 1955. *Mononchus risoceiae*, nova especie (Nematoda, Mononchidae). Rev. Inst. Adolfo Lutz **13**. 129—134.
Cassidy, G. H., 1931. Some mononchs of Hawaii. Hawaiian Pltrs. Rec. **35**, 305—339.
Cayrol, J. C., 1970. Action des autres composants de la biocénose du champignon de couche sur le nématode mycophage, *Ditylenchus myceliophagus* J. B. Goodey, 1958, et étude de son anabiose: Forme de survie en conditions défavorables. Rev. Écol. Biol. Sol **7**, 409—440.
Clark, W. C., 1960. The Mononchidae (Enoplida, Nematoda) of New Zealand II. The genus *Iotonchus* (Cobb, 1916) Altherr, 1950. Nematologica **5**, 260—274.
— 1963. Notes on the Mononchidae (Nematoda) of the New Zealand region with descriptions of new species. N. Z. J. Sci. **6**, 612—632.
Cobb, N. A., 1914. Citrus root nematode. J. Agr. Res. **2**, 217—230.
— 1917. The mononchs: a genus of free-living predatory nematodes. Soil Sci. **3**, 431—486.
— 1918. Filter-bed nemas: nematodes of the slow sand filter beds of American cities. Contrib. Sci. Nematol. **7**, 189—212.
— 1929. Nemas of the genus *Dorylaimus* attacking the eggs of mites. J. Parasitol. **15**, 284 (Abstr.).
Cohn, E., & M. Mordechai, 1973. Biological control of the citrus nematode. Phytoparasitica **1**, 132 (Abstr.).
— — 1974. Experiments in suppressing citrus nematode populations by use of a marigold and a predacious nematode. Nematol. medit. **2**, 43—53.
Coomans, A., & B. Lima, 1965. Description of *Anatonchus amiciae* n. sp. (Nematoda, Mononchidae) with observations on its juvenile stages and anatomy. Nematologica **11**, 413—431.
Decker, H., 1962. Zur Biologie und Ökologie von *Aphelenchus avenae* Bastian, 1865. Wiss. Z. Univ. Rostock, Math.-nat. **11**, 299—305.
De Man, J. G., 1884. Die frei in der reinen Erde und im süßen Wasser lebenden Nematoden der niederländischen Fauna. Leiden.
Dempster, J. P., 1960. A quantitative study of the predators on the eggs and larvae of the broom beetle, *Phytodecta olivacea* Forster, using the precipitin test. J. Anim. Ecol. **29**, 149—167.
Domurat, K., 1970. Nematode communities occurring in spring barley crops. Ekol. Pol. **18**, 681—740.
Doncaster, C. C., 1962. Predators of soil nematodes (film). Parasitology **52**, 19 P.
Doucet, M. E., 1980. Description d'une nouvelle espece de genre *Mylonchulus* (Nematoda: Dorylaimida). Nematol. medit. **8**, 37—42.
Elliott, E. T., R. V. Anderson, D. C. Coleman & C. V. Cole, 1980. Habitable pore space and microbial trophic interactions. Oikos **35**, 327—335.
Esser, R. P., 1963. Nematode interactions in plates of non-sterile water agar. Proc. Soil Crop Sci. Soc. Fla. **23**, 121—138.
— & E. K. Sobers, 1964. Natural enemies of nematodes. Proc. Soil Crop Sci. Soc. Fla. **24**, 326—353.
Ferris, V. R., 1968. Biometric analyses in the genus *Labronema* (Nematoda: Dorylaimida) with a description of *L. thornei* n. sp. Nematologica **14**, 276—284.
Goodey, T., 1929. On some new and little known free-living nematodes. J. Helminth. **7**, 27—62.
— 1942. Observations on *Mononchus tridentatus*, *M. brachyuris* and other species of the genus *Mononchus*. J. Helminth. **20**, 9—24.
— 1963. Soil and freshwater nematodes 2nd edn. (revised J. B. Goodey). London, Methuen, 544 pp.
Goodrich, M., H. C. Hechler, & D. B. Taylor, 1968. *Mononchoides changi* n. sp. and *M. bollingeri* n. sp. (Nematoda; Diplogasterinae) from a waste treatment plant. Nematologica **14**, 25—36.

GROOTAERT, P., & A. JAQUES, 1979. Description of *Butlerius degrissei* n. sp. (Nematoda: Diplogasteridae) with notes on its culture. Nematologica **25**, 203—214.
— — & R. W. SMALL, 1977. Prey selection in *Butlerius* sp. (Rhabditida, Diplogasteridae). Med. Fac. Landbouww. Rijksuniv. Gent. **42**, 1559—1563.
— & D. MAERTENS, 1976. Cultivation and life cycle of *Mononchus aquaticus*. Nematologica **22**, 173—181.
— & R. W. SMALL, 1982. Aspects of the biology of *Labronema vulvapapillatum* (MEYL) (Nematoda, Dorylaimidae) in laboratory culture. Biol. Jb. Dodonaea **50**, 135—148.
— & U. WYSS, 1979. Ultrastructure and function of the anterior feeding apparatus in *Mononchus aquaticus*. Nematologica **25**, 163—173.
HECHLER, H. C., 1963. Description, developmental biology and feeding habits of *Seinura tenuicaudata* (DE MAN) J. B. GOODEY, 1960 (Nematoda: Aphelenchoididae), a nematode predator. Proc. Helminth. Soc. Wash. **30**, 183—195.
— & D. P. TAYLOR, 1966. The life histories of *Seinura celeris*, *S. oliveirae*, *S. oxura* and *S. steineri* (Nematoda: Aphelenchoididae). Proc. Helminth. Soc. Wash. **33**, 71—83.
HIRSCHMANN, H., 1951. Über das Vorkommen zweier Mundhöhlentypen bei *Diplogaster lheritieri* (MAUPAS) und *Diplogaster biformis* n. sp. und die Entstehung dieser hermaphroditischen Art aus *Diplogaster lheritieri*. Zool. Jb. (Syst.). **80**, 132—170.
HOLLIS, J. P., 1957. Cultural studies with *Dorylaimus ettersbergensis* Phytopathology **47**, 468—473.
HUNT, D. J., 1977a. Bionomics of *Paractinolaimus vigor* THORNE, 1967 (Dorylaimida: Paractinolaimidae) with a description of *P. dominicus* n. sp. and *Nygolaimium haguei* n. sp. (Dorylaimida: Aporcelaimidae). Nematologica **23**, 452—462.
— 1977b. Observations on the feeding of *Ironus longicaudatus* (Enoplida: Ironidae). Nematologica **23**, 478—479.
— 1978. *Stomachoglossa bryophilum* n. sp. (Brittonematidae), *Westindicus rapax* n. sp. (Paractinolaimidae), *Caribinema siddiqii* n. sp. and *C. longidens* THORNE, 1967 (Carcharolaimidae) from St. Lucia. Nematologica **24**, 175—183.
— 1980. *Butlerius macrospiculum* n. sp. and *Cylindrocorpus walkeri* n. sp. (Nematoda) from St. Lucia, West Indies. Revue Nematol. **3**, 155—160.
JAIRAJPURI, M. S., 1969. Studies on Mononchida of India I. The genera *Hadronchus*, *Iotonchus* and *Miconchus* and a revised classification of Mononchida, New Order. Nematologica **15**, 557—581.
— & M. I. AZMI, 1978. Some studies on the predatory behaviour of *Mylonchulus dentatus*. Nematol. medit. **6**, 205—212.
LINFORD, M. B., 1937. The feeding of some hollow stylet nematodes. Proc. Helminth. Soc. Wash. **4**, 41—46.
— & J. M. OLIVEIRA, 1937. The feeding of hollow spear nematodes on other nematodes. Science **85**, 295—297.
— — 1938. Potential agents of biological control of plant parasitic nematodes. Phytopathology **28**, 14 (Abstr.).
LOOF, P. A. A., 1964. Free-living and plant parasitic nematodes from Venezuela. Nematologica **10**, 201—300.
LORDELLO, L. G. E., 1970. Pesquisas sôbre nematóides da familia Mononchidae encontrados no Brasil. Anais. Escola. Sup. Agric. 'Luiz de Quieroz' **27**, 15—48.
— & A. P. L. ZAMITH, 1959. Observacoes sôbre o gênero "*Butlerius*" de nematódeos de vida livre. Rev. Bras. Biol. **19**, 177—182.
MCBETH, C. W., 1937. Observations on a predacious nematode. Proc. Helminth. Soc. Wash. **4**, 18.
MAERTENS, D., 1975. Observations on the life cycle of *Prionchulus punctatus* (COBB, 1917) and culture conditions. Biol. Jb. Dodonaea **43**, 197—218.
MANKAU, R., 1975. A semi-quantitative method for enumerating and observing parasites and predators of soil nematodes. J. Nematol. **7**, 119—122.
— 1980. Biological control of nematode pests by natural enemies. Ann. Rev. Phytopath. **18**, 415 to 440.
MARINARI, A., M. T. VINCIGUERRA, N. VOLVAS & A. ZULLINI, 1982. Nematodi delle dune costiere d'Italia. In: Struttura delle zoocenosi terrestri 3. Ambiente Mediterranei I. Le Coste Sabbiose, 27—50.
MENZEL, R., 1920. Über die Nahrung der freilebenden Nematoden und die Art ihrer Aufnahme. Ein Beitrag zur Kenntnis der Ernährung der Würmer. Verhandl. Naturf. Ges. Basel **31**, 153—188.
MEYL, A. H., 1957. Two new free-living nematodes found in the rainwater reserve of *Quesnelia arvensis* (VELL) MEZ. (Bromeliaicae) from Brazil. Proc. Helminth. Soc. Wash. **24**, 62—66.
MICOLETZKY, H., 1921. Die freilebende Erd-Nematoden. Arch. Naturgeschichte, Abt. A. **87**, 1—650.
MOHANDAS, C., & N. R. PRABHOO, 1980. The feeding behaviour and food preferences of predatory nematodes (Mononchida) from the soils of Kerala (India). Rev. Écol. Biol. Sol **17**, 53—60.
MULVEY, R. H., 1961. The Mononchidae: a family of predacious nematodes I. Genus *Mylonchulus* (Enoplida: Nematoda). Can. J. Zool. **39**, 665—696.
— 1962. The Mononchidae: a family of predacious nematodes III. Genus *Miconchus* (Enoplida: Mononchidae). Can. J. Zool. **40**, 65—81.
NELMES, A. J., 1974. Evaluation of the feeding behaviour of *Prionchulus punctatus* (COBB), a nematode predator. J. Anim. Ecol. **43**, 553—565.

Overgaard-Nielsen, C., 1948. Studies on the soil microfauna I. The moss inhabiting nematodes and rotifers. Publ. Soc. Sc. Lettr. d'Aarhus. Ser. Sc. Nat. **1**, 1—98.
Overgaard-Nielsen, C., 1949. Studies on the soil microfauna II. The soil-inhabiting nematodes. Natura Jutlandica **2**, 1—131.
Pillai, J. K., & D. Taylor, 1968a. *Butlerius micans* n. sp. (Nematoda, Diplogasterinae) from Illinois with observations on its feeding habits and key to the species of *Butlerius* Goodey, 1929. Nematologica **14**, 89—93.
— — 1968b. Biology of *Paraigolaimella bernensis* and *Fictor anchicoprophaga* (Diplogasterinae) in laboratory culture. Nematologica **14**, 159—170.
Ritter, M., & C. Laumond, 1975. Perspectives d'emploi des nematodes dans les programmes de lutte biologique contre les parasites et les ravageurs des plantes cultivées. Unpubl. paper presented at the Semaine d'étude agriculture et hygiene des plantes. Gembloux, Belgium.
Russell, C. C., & W. T. Calaway, 1967. Bionomics of an undescribed species of *Mononchoides*. Nematologica **13**, 151—152 (Abstr.).
Samsoen, L., 1984. Experiments with the male of *Prionchulus punctatus* (Cobb, 1917) Andrassy, 1958. Revue Nématol. **7**, 417.
— P. Arpin, S. H. Khan & A. Coomans, 1984. Differentiation of *Prionchulus muscorum* (Dujardin, 1845) Wu & Hoeppli, 1929 and *P. punctatus* (Cobb, 1917) Andrassy, 1958, by egg shell structure. Revue Nématol. **7**, 407—415.
Siddiqi, M. R., 1984. *Nullonchus*, a new genus of toothless mononchs, with comments on the phylogenetic relationship of Nullonchinae n. subfam. (Nematoda: Mononchida). Nematologica **30**, 11—21.
Small, R. W., 1979. The effects of predatory nematodes on populations of plant parasitic nematodes in pots. Nematologica **25**, 94—103.
— & A. A. F. Evans, 1981. Experiments on the population growth of the predatory nematode *Prionchulus punctatus* in laboratory culture with observations on life history. Revue Nématol. **4**, 261—270.
— & P. Grootaert, 1983. Observations on the predation abilities of some soil-dwelling predatory nematodes. Nematologica **29**, 109—118.
Sohlenius, B., 1968a. Influence of microorganisms and temperature upon some rhabditid nematodes. Pedobiologia **8**, 137—145.
— 1968b. Studies of the interactions of *Mesodiplogaster* sp. and other rhabditid nematodes and a protozoan. Pedobiologia **8**, 340—344.
— 1979. A carbon budget for nematodes, rotifers and tardigrades in a Swedish coniferous forest soil. Holarctic Ecology **2**, 30—40.
Spaull, V. W., 1973. Distribution of nematode feeding groups at Signy Island, South Orkney Islands with an estimate of their biomass and oxygen consumption. British Antarctic Survey Bull. **37**, 21—32.
Steiner, G., 1924. On some plant parasitic nemas and related forms. J. Agric. Res. **28**, 1059—1075.
— & H. Heinly, 1922. The possibility of control of *Heterodera radicicola* and other plant injurious nematodes by means of predatory nemas, especially *Mononchus papillatus*. J. Wash. Acad. Sci. **12**, 367—385.
Stephenson, W., 1942. On the culturing of *Rhabditis terrestris*. Parasitology **34**, 246—252.
Szczygiel, A., 1966. Studies on the fauna and population dynamics of nematodes occurring on strawberry plantations. Ekol. Pol. **14**, 651—709.
Szczygiel, A., 1971. Wystepowanie drapieznych nicieni z rodziny Mononchidae w glebach uprawnych w Polsce. Zesze. probl. Postep. Nauk. roln. **121**, 145—158.
Tarjan, A. C., & B. E. Hopper, 1974. Nomenclatorial compilation of plant and soil nematodes. Soc. Nematol. 419 pp.
Taylor, D. P., 1964. *Butlerius monhystera* (Nematoda, Diplogasterinae) a new species of predaceous nematode from Illinois. Proc. Helminth. Soc. Wash. **31**, 129—132.
Thorne, G., 1924. Utah nematodes of the genus *Mononchus*. Trans. Am. Microscop. Soc. **43**, 157 to 171.
— 1927. The life history, habits and economic importance of some mononchs. J. Agric. Res. **34**, 265—286.
— 1928. Nematodes inhabiting the cysts of the sugar beet nematode (*Heterodera schachtii* (Schmidt). J. Agric. Res. **37**, 571—575.
— 1930. Predacious nemas of the genus *Nygolaimus* and a new genus, *Sectonema*. J. Agric. Res. **41**, 445—466.
— 1932. Specimens of *Mononchus acutus* found to contain *Trichodorus obtusus*, *Tylenchus robustus* and *Xiphinema americanum*. J. Parasitol. **19**, 90.
— 1939. A monograph of the nematodes of the superfamily Dorylaimoidea. Capita Zool. **8**, 1—261.
— & H. H. Swanger, 1936. A monograph of the nematode genera *Dorylaimus*, *Aporcelaimus*, *Dorylaimoides* and *Pungentus*. Capita Zool. **6**, 1—223.
Vinciguerra, M. T., 1979. Role of nematodes in the biological processes of the soil. Boll. Zool. **46**, 363—374.
Williams, R. J., 1958. Studies on the nematode fauna of sugar cane fields in Mauritius. I. The genus *Mononchus* (Trilobidae, Enoplida). Occas. paper Maur. Sugar Ind. Res. Instit. **1**, 13 pp.

Wood, F. H., 1973a. Nematode feeding relationships. Feeding relationships of soil dwelling nematodes. Soil Biol. Biochem. **5**, 593—601.
— 1973b. Biology of *Aporcelaimellus* sp. (Nematoda: Aporcelaimidae) Nematologica **19**, 528—537.
— 1974. Biology of *Seinura demani* (Nematoda: Aphelenchoididae). Nematologica **20**, 347—353.
Wyss, U., & P. Grootaert, 1977. Feeding mechanisms in *Labronema* sp. Med. Fac. Landbouww. Rijskuniv. Gent **42**, 1521—1527.
Yeates, G. W., 1967a. Studies on nematodes from dune sands 3. Oncholaimidae, Ironidae, Alaimidae and Mononchidae. N.Z. Jl. Sci. **10**, 299—321.
— 1967b. Studies on nematodes from dune sands 6. Dorylaimoidea N.Z. Jl. Sci. **10**, 752—784.
— 1967c. Studies on nematodes from dune sands 7. Monhysterida and Chromadorida. N.Z. Jl. Sci. **10**, 785—801.
— 1967d. Studies on nematodes from dune sands 9. Quantitative comparison of the nematode faunas of six localities. N. Z. Jl. Sci. **10**, 927—948.
— 1968. An analysis of annual variation of the nematode fauna in dune sand at Himatangi Beach, New Zealand. Pedobiologia **8**, 173—207.
— 1969. Predation by *Mononchoides potohikus* (Nematoda, Diplogasteridae) in laboratory culture. Nematologica **15**, 1—9.
— 1971. Feeding types and feeding groups in plant and soil nematodes. Pedobiologia **11**, 173—179.
— in press. Nematode feeding and activity: the importance of developmental stages. Biol. Fert. Soils.
Zullini, A., 1978. Nematodi liberi dell'Isola di Tavolara (Sardegna). Accad. Naz. Dei XL Serie V **3**, 67—76.
— 1981. Three new species of diplogasterids (Nematoda). Boll. Mus. Civ. St. Nat. Verona **7**, 395 to 404.

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Synopsis: *Subject review article*

Small, R. W., 1987. A review of the prey of predatory soil nematodes. Pedobiologia **30**, 179—206.

The methods by which the prey of predatory nematodes may be identified are discussed. New data based on gut content analysis are presented for a field population of *Anatonchus tridentatus*; wide polyphagy was apparent as only 5 of the 23 species in the soil nematode community were not represented in the gut contents. Some selection of prey may occur as dorylaimids were considerably more common in the gut contents than in the soil nematode community. A review of the literature on the diet of predatory nematodes is presented with summarised information for 55 mononchid 49 dorylaimid, 11 tylenchid, 21 diplogasterid and 16 other predators. Analysis of the records in terms of taxonomic group of all prey and the trophic group of nematode prey are made; over 60 % of the records are of nematode prey with phytoparasites and microbivores constituting approximately one-third each.

Key words: nematodes, predation, prey, feeding.